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EXAMINER

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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Application Number: 09/760,499
Filing Date: January 11, 2001
Appellant(s): YAMAZAKI ET AL.

William Hughes
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 9/3/04.

(1) *Real Party in Interest*

A statement identifying the real party in interest is contained in the brief.

(2) *Related Appeals and Interferences*

A statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

(3) *Status of Claims*

The statement of the status of the claims contained in the brief is correct.

(4) *Status of Amendments After Final*

The appellant's statement of the status of amendments after final rejection contained in the brief is incorrect.

The amendment after final rejection filed on 1/5/04 has been entered.

(5) *Summary of Invention*

The summary of invention contained in the brief is correct.

(6) *Issues*

The appellant's statement of the issues in the brief is correct.

(7) *Grouping of Claims*

Appellant's brief includes a statement that claims 1-6, 16-19, 21-24, 26-30, 32-34, and 36-42 do not stand or fall together and provides reasons as set forth in 37 CFR 1.192(c)(7) and (c)(8).

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(8) Claims Appealed

A substantially correct copy of appealed claims 1-6, 16-19, 21-24, 26-30, 32-34, and 36-42 appears on pages 1-5 of the Appendix to the appellant's brief. The minor errors are as follows: In claim 36, line 12 the word "electrode" was removed in the amendment after final rejection filed 1/5/04.

(9) Prior Art of Record**(A) Listing of the Prior Art of Record**

5,821,138	YAMAZAKI et al.	10-1998
5,757,456	YAMAZAKI et al.	5-1998

The Admitted Prior Art (Specification pages 1 and 2)

(B) Brief Description of the Prior Art of Record

Yamazaki et al. '138 disclose a technique of manufacturing a flexible, light weight display device having a substrate such as plastic on its upper and lower surfaces wherein due to the low heat resistance of the plastic the display device is first formed (part of the forming occurring in a high temperature atmosphere) on a removable substrate such as glass. Yamazaki et al. '138 teach the technique comprises providing a first substrate (e.g. glass), forming a peeling layer on the first substrate, forming an insulating layer on the peeling layer, forming a semiconductor element (e.g. in a high temperature atmosphere) on the insulating layer, bonding a flexible, light weight second substrate (e.g. plastic) to the semiconductor element using a first adhesive, exposing the peeling layer to halogen fluoride to remove the peeling layer and the first substrate, and thereafter bonding a third flexible, light weight substrate (e.g. plastic) to the insulating layer using a second adhesive to form the display device. Yamazaki et al. '138 teach

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the technique is used to form display devices including a liquid crystal display device or an electro luminescence (EL) display device.

Yamazaki et al. '456 disclose a method of manufacturing a display device wherein the device is formed on a peeling layer and a first substrate such that upon completion of the device halogen fluoride gas is used to remove the peeling layer and the first substrate from the device.

The admitted prior art discloses known light weight EL display devices include a light-emitting element comprising an anode, a cathode, and an EL material sandwiched therebetween.

(10) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1-6, 16-19, 21-24, 26-30, 32-34, and 36-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamazaki et al. (U.S. Patent 5,821,138) in view of the admitted prior art (Specification pages 1 and 2) and Yamazaki et al. (U.S. Patent 5,757,456).

Yamazaki et al. '138 disclose a technique of manufacturing a flexible, light weight display device having a substrate such as plastic on its upper and lower surfaces wherein due to the low heat resistance of the plastic the display device is first formed (part of the forming occurring in a high temperature atmosphere) on a removable substrate such as glass (Figures 1-4 and Column 1, lines 10-17 and 41-67 and Column 2, lines 1-4 and 39-67 and Column 3, lines 1-20). Yamazaki et al. '138 teach the technique comprises forming a peeling layer (e.g. a silicon oxide film) on a first substrate (e.g. glass) (Column 6, lines 50 and 61-62), forming an insulating layer (e.g. a silicon oxide film) on the peeling layer (Column 7, lines 38-39), forming (e.g. in a high temperature atmosphere) a semiconductor element (e.g. active layers, a gate insulating

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layer, gate electrodes, a first interlayer insulating layer, wirings, and pixel electrode/anode) on the insulating layer (Column 8, lines 21-27, 31-35, and 57-58 and Column 9, lines 5-8), bonding a flexible, light weight second substrate (e.g. plastic) to the semiconductor element using a first adhesive (e.g. epoxy resin, acrylate resin, polyimide resin etc.) (Column 9, lines 9-12 and 17-20), exposing the peeling layer to halogen fluoride to remove the peeling layer and the first substrate (Column 9, lines 25-26 and 40-42), and bonding a third flexible, light weight substrate (e.g. plastic) to the insulating layer using a second adhesive to form the flexible, light weight display device (Column 9, lines 53-56). Yamazaki et al. '138 are silent as to a specific teaching of an example or embodiment including a light-emitting element in the display device. However, Yamazaki et al. '138 teach the general technique is used to form both liquid crystal display devices and electro luminescence (EL) display devices (Column 6, lines 47-49), it being noted the examples and embodiments in Yamazaki et al. '138 only specifically teach forming the liquid crystal display devices. One of ordinary skill in the art at the time the invention was made would have readily appreciated using the general technique taught by Yamazaki et al. '138 to form an EL display device wherein included in the display device is a light emitting element, i.e. pixel electrode/anode layer having a cathode layer applied to its upper surface with a layer of EL material sandwiched therebetween, coupled to the semiconductor element as it was well known in the art that an EL display device includes a light-emitting element as shown for example by the admitted prior art and **as noted above Yamazaki et al. '138 clearly teach the method may be used to form an EL device.**

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The admitted prior art discloses known light weight EL display devices include a self-emissive light-emitting element comprising an anode, a cathode, and an EL material sandwiched therebetween (Specification page 1, lines 15-25 and page 2, lines 1-6).

It is noted Yamazaki et al. '138 do not specifically teach a halogen fluoride *gas* to remove the peeling layer and first substrate. Absent any unexpected results, it would have been well within the purview of one of ordinary skill in the art at the time the invention was made to use a halogen fluoride *gas* to remove the peeling layers as halogen fluoride gas was a well known means for removing a silicon film peeling layer as shown for example by Yamazaki et al. '456.

Yamazaki et al. '456 disclose a method of manufacturing a display device wherein the device is formed on a peeling layer and a first substrate such that upon completion of the device halogen fluoride gas is used to remove the peeling layer and the first substrate from the device (Column 4, lines 25-37 and Column 6, lines 24-25 and Column 8, lines 6-8).

(11) Response to Argument

Claim 1 (all of the claims stand or fall together)

Appellants argue, "Based on the above description, Applicant submits that Yamazaki et al. '138 discloses, at best, formation of a portion of a liquid crystal element that is covered with flexible substrate 120, followed by use of the peeling layer (102) to remove substrate (101). Thus, formation of the liquid crystal display (e.g., addition of the second panel 122/123/124 and implantation of liquid-crystal material) does not occur until after the addition of the substrate 120 and the peeling of the layer 102 (to remove substrate 101).

Yamazaki et al. '138 disclose a technique of manufacturing a flexible, light weight display device having a substrate such as plastic on its upper and lower surfaces wherein due to the low heat resistance of the plastic the display device is first formed (part of the forming

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occurring in a high temperature atmosphere) on a removable substrate such as glass. Yamazaki et al. '138 teach the technique is used to form display devices including a liquid crystal display device or **an electro luminescence (EL) display device**. Yamazaki et al. '138 teach the **general** technique comprises forming a peeling layer on a first substrate, forming an insulating layer on the peeling layer, forming a semiconductor element on the insulating layer, bonding a flexible, light weight second substrate to the semiconductor element using a first adhesive, exposing the peeling layer to halogen fluoride to remove the peeling layer and the first substrate, and thereafter bonding a third flexible, light weight substrate to the insulating layer using a second adhesive to form the display device. Yamazaki et al. '138 specifically teach this technique in relation to forming **a liquid crystal display device** in Figures 1-4. Yamazaki et al. '138 teach the specific technique comprises forming a peeling layer (102) on a first substrate (101), forming an insulating layer (103) on the peeling layer, forming a semiconductor element (110-118) on the insulating layer, bonding a flexible, light weight second substrate (120) to the semiconductor element using a first adhesive (119), exposing the peeling layer to halogen fluoride to remove the peeling layer and the first substrate, and thereafter bonding a third flexible, light weight substrate (124) to the insulating layer using a second adhesive to form the liquid crystal display device.

The specific technique disclosed in Figures 1-4 is to a liquid crystal display device.

Yamazaki et al. '138 while **clearly** stating the general technique may be used to form EL display devices do not specifically teach an example or embodiment implementing the technique to form an EL display device. However, the differences for forming each device are extremely well known in the art and would have been obvious to one of ordinary skill to form an operable EL display device, it being noted only two obvious modifications are required. The first

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modification is required by claim 1. An EL display device as opposed to a liquid crystal display device includes a light emitting element to provide a self-emitting display as opposed to a liquid crystal display device that uses a liquid crystal material display, and as such it would have been obvious to include a light emitting element coupled to the semiconductor element in the technique taught by Yamazaki et al. '138 when used to form an operable EL display device. The admitted prior art is cited as exemplary of the well known and conventional technique of including a light emitting element in an EL display device. The second modification is not required by claim 1. An EL display device as opposed to a liquid crystal display device is self-emitting and has no need for liquid crystal material such that in bonding the third flexible, light weight substrate (124 as shown in Figure 4) in the formation of a flexible, light weight EL display device liquid crystal material elements (121, 122, 123, and 125 as shown in Figure 4) would obviously be omitted.

Appellants further argue, "In short, the Examiner takes the following position(s): that "the technique" of Yamazaki '138, if used to form an EL device, would necessarily result in the claimed invention, in order for such an EL device to be operable, and, further, that Applicant's statements to the effect that glass substrates may be used in higher-temperature processing environments than plastic films necessarily implies formation of the EL element prior to formation of the layer 120 of Yamazaki '138, and prior to removal of peeling layer 102 (and glass substrate 101) of Yamazaki '138.

In response to these arguments, and contrary to them, Applicant submits that there are multiple methods by which "the technique" of Yamazaki '138 might have been applied in the formation of an EL device, and that the Examiner has selected Applicant's claimed method from among these multiple methods only with the benefit of impermissible hindsight.

For example, "the technique" of Yamazaki '138 may have been used to form an EL device according to the following technique. First, a part of the EL device may have been formed on the peeling layer (102)/substrate (101) structure, and the second substrate (120) may have been bonded over the part of the EL device. Then, the peeling layer (102)/substrate (101) structure may have been removed (peeled away), and a third substrate (124) may have been added in its place (where liquid crystal material (125) is not included for forming the EL device). Then, the second substrate (120) may have been removed, so that formation of the EL device may have been completed. Then, a

fourth substrate may have been added over the formed EL device (element), and the device thereby completed.¹³

First, it is noted the claims are not commensurate in scope with appellants arguments.

None of the claims require forming a "completed" light emitting element prior to peeling.

Furthermore, the Examiners previous comments regarding forming an operable completed light-emitting element still apply, i.e. forming an operable EL display device using the technique described by Yamazaki et al. '138 would include forming the completed light emitting element directly on the semiconductor element prior to peeling, thus excluding the possibility of partially forming the light emitting element on the semiconductor element, bonding the second substrate onto the partially formed light emitting element, performing the peeling and bonding the third substrate, and then completely forming the light emitting element on the second substrate as this would form an inoperable EL display device wherein the second substrate separates portions of the light emitting element. Second, it is Yamazaki et al. '138 which suggests any layers that require forming at high temperatures should occur prior to peeling and bonding of the low heat resistant flexible plastic substrates such that it appears forming a completed light emitting element would occur prior to peeling to avoid any distortion of the plastic substrates during formation of the light emitting element. In any event, as noted above this argument is not commensurate in scope with what is claimed. Finally, as to appellants arguments that the EL display device may have been formed by an alternative technique disclosed in commonly assigned U.S. Publication 2003/0217805 it is noted the alternative technique is further evidence that the EL display device is formed in Yamazaki et al. '138 according to the technique set forth above, i.e. both techniques suggest forming an operable EL display device would include a completed light emitting element directly coupled to the semiconductor element. The only

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difference between the alternative technique suggested by appellants and the technique described above in the rejection is that the alternative technique proposes only partially forming the light emitting element, bonding the second substrate to the partially formed light emitting element, removing the peeling layer and the first substrate, bonding a third substrate in place of the first substrate, and **thereafter removing the second substrate, completing the light emitting element, and bonding a fourth substrate to the completed light emitting element.** A fourth substrate is clearly not contemplated by Yamazaki et al. '138 such that it is unclear how Yamazaki et al. '138 could have been describing this alternative embodiment. In any event, even if Yamazaki et al. '138 were taken to infer the alternative technique proposed by appellants, the technique in the same manner as the technique proposed above in the rejection meets all of the claim limitations.

In conclusion, Yamazaki et al. '138 teach a technique used to form display devices including a liquid crystal display device or an EL display device. The technique for forming an EL display device would obviously have included forming a light emitting element as evidenced by the admitted prior art and appellants cited U.S. Publication, and while Yamazaki et al. '138 do not provide a detailed example or embodiment using the technique for forming an EL display device as evidenced in the rejection and by appellants cited U.S. Publication in order to form an operable EL display device using the general technique of Yamazaki et al. '138 all of the claim limitations would be met.

For the above reasons, it is believed that the rejections should be sustained.

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Respectfully submitted,



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October 26, 2004

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